Amended Claims

What is claimed as being new and desired to be protected by Letters Patent of the United States as follows:

1. A method and system to support customized multi-priority services over any data-link communication layer frame type **carrying user information data**, comprising the steps of:

(a) assigning and reserving single or plurality of bytes, known as sub-framing bytes, in the location(s) preferably adjacent to the trailing bytes of said data-link layer frame;

(b) assigning and reserving single or plurality of bytes being uniquely identified through a fixed byte(s) distance from the trailing or ending flag of said data-link layer frame;

(c) splitting each said data-link frame carrying user data into so-called data-link layer segments, each said segment carrying portion of user data frame along with sub-framing byte(s) as defined through (a) and (b); and,

(d) appending an updated CRC (Cyclic Redundancy Check) or FCS (Frame Check Sequence) field that covers data-link layer segment header, information bytes included in the segment and sub-framing byte(s).

2. The method and system according to claim 1, wherein sub-framing byte(s) in a data-link layer frame/segment has the functionality, comprising the steps of:

using the bit values of the said sub-framing byte(s) to generate and represent a sequence numbers such that an individual sequence number can be used to identify and associate with a unique priority service class that needs to be transmitted or received over a single or multiple communication links;

using the bit values of the said sub-framing byte(s) to generate and represent a range of sequence numbers such that each range of predefined sequence numbers can be used to identify and associate with a unique priority service class that needs to be transmitted or received over a single or multiple communication links; and,

interpreting the bit values of the said sub-framing byte(s) in a manner that uniquely identify a class priority associated with a data-link layer frame.

3. The method and system according to claim 1, wherein the said method and system dynamically calculates and update the CRC or FCS field as each byte of a data-link frame is transmitted through the said system.

1

4. The method and system according to claim 1, wherein the said system can split or interrupt the ongoing transmission of any type of data-link layer frame/segment, comprising the steps of:

determining the byte position where the ongoing transmission of a data link layer frame needs to be interrupted;

inserting the sub-framing byte(s) following the interrupting byte position of the data link layer frame/segment;

inserting the updated CRC or FCS value following the sub-framing byte(s) position; and,

inserting the closing flag following the CRC or FCS value of the data link layer frame/segment.

5. The method and system according to claim 1, wherein the intermediate data-link layer devices or switches which are not aware of the said system and method transparently pass the data-link frames/segments containing the sub-framing byte(s).

6. The method and system according to claim 1, wherein the said method and system use the sub-framing byte(s) for prioritizing, comprising the steps of:

means of using customized multi-priority algorithm; and,

means of assigning weight parameters to a service class represented by the sub-framing byte(s) such that the assigned parameters can be static or dependent on other transmission or user-defined variables;

7. The method and system according to claim 6, wherein the transmission priorities of data-link layer frames on a per byte basis or in any proportion can be statically defined or dynamically linked with any type of transmission related parameters.

8. The method and system according to claim 6, wherein the said multi-priority algorithm provides a way to dynamically adjust and escalate the priority level of an initially declared low priority service to a high priority level.

9. The method and system according to claim 2, wherein the said system reserves and pre-assigns the position of a single or multiple bytes in a data link layer frame being transmitted on a single communication link such that certain possible sequence values generated by the sub-framing byte(s) can be uniquely defined and deterministically represent a service class without the need to identify any additional information enclosed in the data link header of the frames belonging to that particular service class.

10. The method and system according to claim 2, wherein the said method and system use a unique sequence number range defined by the sub-framing byte(s) within a data-link layer frame being transmitted on a single or multiple communication links such that

2

the assigned sequence range can uniquely represent a distinct service class without the need to identify any additional information enclosed in the data link header of the frames belonging to a particular service class.

11. The method and system according to claim 1, wherein the said method and system can re-use a uniquely identified sequence number range assigned through sub-framing service byte(s) for a particular service class being transmitted over a single or multiple communication links.

12. The method and system according to claim 1, wherein the said method and system use a uniquely identified sequence number range to identify multiple segments of a single frame received by a destination host over multiple links.

13. The method and system according to claim 1, wherein the said system supports a cut-